

1 REMARKS

2 Status of the Claims

3 Claims 1 – 36 remain pending in the application. Claim 22 has been amended to correct a
4 typographical error that caused part of the preamble to be omitted (see Claim 16).

5 Specification

6 The Examiner noted that on page 9, line 5, the acronym “VLCs” is used and suggests that
7 applicants spell out all first instances of all acronyms for clarification. However, applicants did
8 identify the acronym “VLC” as corresponding to variable length coding on page 8, line 30 of the
9 specification.

10 Claims Rejected under 35 U.S.C. § 112, Second Paragraph

11 The Examiner has rejected Claims 1 – 36 under 35 U.S.C. § 112, second paragraph as being
12 indefinite for failing to particularly point out and distinctly claim the subject matter regarded by
13 applicants as their invention. Specifically, the Examiner objects to the use by applicants of the words
14 “perceptually” and “subsequently” in independent claims 1, 16, 22, and 29 for failing to “specify a
15 definite limitation for the claims.” Applicants respectfully disagree for the following reasons.

16 The term “perceptual” is defined in regard to a “perceptual signal” on page 4, lines 4 – 6: “a
17 *specific type of input signal and refers specifically to a signal that includes audio and/or video data,*
18 *i.e., data that can be used to produce audible sound and/or a visual display.”* On page 13, lines 25 –
19 34, the specification of the present application further explains the meaning of “perceptual relevance”
20 as follows.

21 It must be emphasized that the present invention is applicable to almost any type of
22 signal that does not require retention of all of the data conveyed by the signal. For
23 example, the present invention can be applied to video data, since *perceptually less*
24 *important* data can be omitted from the signal recovered from data packets formed in
25 accord with the present invention. The present invention is particularly applicable to
26 forming data packets of *perceptual data*, since the effects on a signal produced using
27 data packets from which less important data have been truncated by the present
28 invention is generally very acceptable *when aurally and/or visually perceived by a*
29 *user.* (Emphasis added.)

30 In combination with the specific definition provided by applicants for “perceptual signal,” the
above quote makes it clear that “perceptually less important” in connection with a signal relates to the
aural and/or visual perception of the signal by a user, i.e., truncation of such perceptually less

1 important data packets from a signal does not adversely impact the perception of the signal by a user.
2 Conversely, it should be apparent that “perceptually more important” refers to data in a signal that is
3 important and is retained to benefit the aural and/or visual perception of that data by a user.
4 Throughout the specification, applicants have explained the relevance of signal processing in
5 relationship to the *perceptual* quality of the signal that is thus produced. Accordingly, the use of the
6 term “perceptually” in the claims is not unclear and does not justify a rejection of the claims under 35
7 U.S.C. § 112, second paragraph.

8 More importantly, the use of the term “perceptually” is common in this art and is readily
9 understood by those of ordinary skill. Enclosed herewith is a copy of an exemplary technical paper
10 that relates to signal processing and which demonstrates that the term “perceptually” is commonly
11 used by those of ordinary skill. [Note that this paper is not believed to be material or relevant to the
12 patentability of the claims in the present application, and thus, is not being cited in an Information
13 Disclosure Statement, but instead, is provided simply as evidence that the term “perceptually” is well
14 known in the art of signal processing.]

15 The paper, by T. Painter and A. Spanias, “Perceptual Segmentation and Component Selection
16 in Compact Sinusoidal Representations of Audio,” Proceedings of the IEEE Volume 88, Issue 4,
17 April 2000 Pages: 451 – 515, Digital Object Identifier 10.1109/5.842996, uses “perceptually” nine
18 times. For example, in the middle of the first paragraph, second column, second page, the article
19 states: “It was shown that the transient processor is able to identify the *most perceptually significant*
20 transients, and that the scheme provides a natural scaling mechanism for low rate applications.”
21 (Emphasis added.) The Examiner is invited to scan the article to identify the other instances in which
22 “perceptually” is used.

23 There are many other references in this art that use the term “perceptually,” and at least a few
24 of these references can readily be identified by making a search on the Internet. Accordingly, it will
25 be evident that the term “perceptually” used in applicants’ claim, will readily be understood by one of
26 ordinary skill in the art, both because of the definition and disclosure provided by applicants’
27 specification and because the term is commonly used in this technology.

28 The Examiner also objects to the use of the term “subsequently” in the claims. However, the
29 normal meaning of the term “subsequently” applies to its use in the claims and this meaning is not
30 unclear. For example, in Claim 1, step (d)(ii), applicants recite, “so that the coefficients that are less

1 perceptually relevant can subsequently be truncated from the data packet.” This term could be
2 replaced with the synonym “later,” but there is no reason to amend the claim in this manner, since the
3 meaning of the phrase in which “subsequently” appears is clear on its face. Webster’s online
4 dictionary (at <http://www.webster-dictionary.net>) defines the word subsequently as “at a later time;
5 afterwards.” Thus, it will be apparent that the step quoted above simply means that coefficients that
6 are less perceptually relevant can be truncated from the data packet at a later time. Accordingly, the
7 term “subsequently” is not unclear.

8 Since both of the terms “perceptually” and “subsequently” have been shown not to be unclear,
9 the Examiner is asked to withdraw the rejection of all of the claims under 35 U.S.C. § 112, second
10 paragraph.

11 Claims Rejected under 35 U.S.C. § 102(b)

12 The Examiner has rejected Claims 1 and 13 as being anticipated by U.S. Patent No. 5,303,058
13 (Fukuda et al. – hereinafter referred to as “Fukuda”). The Examiner takes the position that Fukuda
14 discloses each step of Claim 1 and cites to various portions of Fukuda in support of the rejection.
15 Applicants respectfully disagree with the Examiner for the following reasons.

16 The Examiner cites col. 1, lines 38-45, and col. 2, lines 3-14 of Fukuda as anticipating step (a)
17 of Claim 1, which recites “implementing a two-dimensional transform of the signal, producing a
18 transform matrix having *modulation frequency* as one dimension,” (emphasis added). However, in
19 reviewing the cited portion of Fukuda, it is apparent that Fukuda does not produce or use a transform
20 matrix having *modulation frequency* as one dimension. Instead, col. 1, lines 38-45 of Fukuda refer to
21 a prior art approach for performing a two-dimensional discrete cosine transform (DCT) that is
22 transformed into a matrix of DCT coefficients “corresponding to respective space frequency
23 distributions.” Lines 3-14 of col. 2 in Fukuda refer to FIG. 6 and teach scanning a quantized
24 coefficient matrix D_{QU} according to a zig-zag scan order to rearrange the two-dimensionally arrayed
25 elements into a one-dimensional array. However, Fukuda does not teach or suggest a two-
26 dimensional transform to produce a matrix with “modulation frequency as one dimension,” as recited
27 in step (a) of Claim 1. Fukuda does not include any provision for modulation detection and thus,
28 could not use such a matrix. Accordingly, Fukuda does not anticipate step (a) of the claim.

29 In regard to step (b) of Claim 1, the Examiner cites col. 2, lines 25-28 of Fukuda. Step (b)
30 recites, “*reducing a dynamic range of the signal*” (emphasis added). In contrast, Fukuda teaches a

1 coder 31 that “reduces the *volume of data* necessary for expressing the quantized coefficient matrix
2 D_{QU}.” Clearly, reducing the dynamic range of a signal is NOT equivalent to reducing the volume of
3 data, since reducing the volume of data would refer, for example, to eliminating data packets, which
4 is not at all related to reducing a dynamic range of data. Reducing dynamic range refers, for
5 example, to compressing a loudness range of an audio signal, which is not done by eliminating data
6 to reduce the volume of data. Accordingly, Fukuda does not teach or suggest step (b) of Claim 1.

7 Step (d) recites, “producing data packets in which the coefficients that have been selected are
8 encoded based upon a desired order of the coefficients, with coefficients that are more perceptually
9 relevant being used first to fill each data packet and coefficients that are less perceptually relevant
10 being handled in one of the following ways.” The Examiner cites col. 2, lines 3-14 of Fukuda as
11 disclosing this step. However, as noted above, this portion of Fukuda teaches a zig-zag scan of the
12 quantized coefficient matrix, producing a one-dimensional matrix with the DC element at the head
13 end followed by the AC elements having lower space frequencies. No mention is made by Fukuda of
14 “perceptually relevant” as a basis for ordering coefficients in a matrix. Accordingly, there is simply
15 no basis for the Examiner to assert that Fukuda teaches this aspect of applicants’ claim recitation.
16 Similarly, contrary to the Examiner’s assertion, col. 2, lines 54-64, col. 5, lines 29-40, and col. 6,
17 lines 10-18 of Fukuda fail to teach or suggest substeps (i) and (ii) of step (d) in Claim 1. Substep (i)
18 provides that the coefficients that are less perceptually relevant are discarded once an available space
19 in each data packet that is to be stored or transmitted has been filled with the coefficients that are
20 more perceptually relevant. Substep (ii) provides that the data packets that are less perceptually
21 relevant are disposed last within each data packet, so that the coefficients that are less perceptually
22 relevant can subsequently be truncated from the data packet. Since Fukuda is not concerned with the
23 perceptual relevance of coefficients, it is not surprising that this cited art fails to teach or suggest
24 these substeps or any equivalents thereof. Instead, Fukuda teaches ordering the quantized
25 coefficients based on their magnitude (i.e., their “significance” as taught by Fukuda). This ordering
26 is not related to perceptual relevance, however. Accordingly, there is no basis for asserting the
27 Fukuda teaches step (d) or substeps (i) and (ii).

28 In consideration of the preceding remarks, it should be evident that there is no basis for
29 asserting that Fukuda anticipates Claim 1. None of the steps of this claim are disclosed or suggested
30 by Fukuda. Therefore, the Examiner is asked to withdraw the rejection of Claim 1 over Fukuda.

1 In rejecting Claim 13, the Examiner asserts that col. 1, lines 57-67 and col. 2, lines 1-2
2 disclose that applicants' "step of producing the data packets includes the step of ordering the data
3 corresponding to the signal with respect to their perceptual relevance so that data having lower
4 modulation frequencies and lower base-transform frequencies are inserted into a data packet before
5 data having higher modulation frequencies and higher base-transform frequencies." Applicants
6 respectfully disagree. As noted above, Fukuda fails to teach or suggest any use of data having
7 modulation frequencies. Although Fukuda provides for ordering data on the basis of "*space*
8 *frequencies*" because of the generally greater sensitivity of human vision to higher space frequencies,
9 Fukuda does not mention, and one of ordinary skill would not be led by Fukuda to order data in data
10 packets on the basis of *modulation frequencies*, as recited by Claim 13. Accordingly, Fukuda does
11 not teach or suggest what is recited in Claim 13, and this rejection should be withdrawn. In addition,
12 Claim 13 ultimately depends on Claim 1 and is patentable for at least the same reasons as it is, as
13 discussed above.

14 In consideration of the preceding Remarks, it should be apparent that all claims in this
15 application are allowable over the art of record. The Examiner is therefore requested to pass this case
16 to issue without further delay. Should any issues remain, the Examiner is invited to telephone
17 applicants' attorney at the number listed below.

18 Respectfully submitted,

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22 RMA:elm

23 MAILING CERTIFICATE

24 I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed
25 envelope as first class mail with postage thereon fully prepaid addressed to: Commissioner for Patents,
Alexandria, VA 22313-1450, on December 9, 2005.

26 Date: December 9, 2005

27 *Elizabeth L. Miller*

28 Enclosure:

29 Copy of Paper
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